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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,910	07/03/2001	Richard Stirling-Gallacher	450117-03250	1395

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EXAMINER

DEAN, RAYMOND S

ART UNIT	PAPER NUMBER
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2618

DATE MAILED: 11/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/897,910	Applicant(s) STIRLING-GALLACHER ET AL.	
	Examiner Raymond S. Dean	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13 - 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13 - 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed September 28, 2004 have been fully considered but they are not persuasive.

Examiner respectfully disagrees with Applicants' assertion that the Jones, Cimini, and Ramesh references do not disclose a filter being selected from a set of filters on the basis of an estimated carrier to interference ratio.

Jones teaches a device for receiving signals in a wireless cellular orthogonal frequency division multiplex (OFDM) system (Column 2 lines 34 – 36), in which data symbols are transmitted in frequency sub-carriers and timeslots (Column 2 lines 36 – 40), comprising channel estimation means for performing a channel estimation on the basis of received pilot symbols (Column 3 lines 11 – 19), whereby the channel estimation for the data symbols between pilot symbols is performed by means of a filter selected on the basis of an interference value (Figure 3, Column 3 lines 46 – 53, the IFFT/interference block is the filter that is selected due to the fact that there is interference, said filter in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for the burst, which comprises pilot (training) symbols and data symbols). Cimini teaches a set of filters (Column 4 lines 62 – 66). Jones and Cimini both teach a wireless OFDM system that uses channel estimation thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the set of filters taught in Cimini in the wireless OFDM

Art Unit: 2618

system of Jones such that there will be a wireless OFDM system that adapts to the Doppler shift and multi-path delay spread that is in said wireless OFDM systems.

Ramesh teaches a carrier to interference ratio (Column 3 lines 25 – 37). Jones in view of Cimini and Ramesh teach a wireless communication system where the receiver uses the least squares method for channel estimation in a multi-path environment thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the carrier to interference ratio taught in Ramesh in the wireless communication system of Jones in view of Cimini for the purposes of providing improved estimates of said carrier to interference ratio for channels subject to multi-path fading effects. The combination of Jones, Cimini, and Ramesh teaches the above limitation.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 13 – 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones IV et al. (US 6,487,253 B1) in view of Cimini Jr. et al. (US 6,327,314 B1) and in further view of Ramesh (US 6,463,105 B1).

Regarding Claim 13, Jones teaches a device for receiving signals in a wireless cellular orthogonal frequency division multiplex (OFDM) system (Column 2 lines 34 – 36), in which data symbols are transmitted in frequency sub-carriers and timeslots (Column 2 lines 36 – 40), comprising channel estimation means for performing a channel estimation on the basis of received pilot symbols (Column 3 lines 11 – 19), whereby the channel estimation for the data symbols between pilot symbols is performed by means of a filter selected on the basis of an interference value (Figure 3, Column 3 lines 46 – 53, the IFFT/interference block is the filter that is selected due to the fact that there is interference, said filter in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for the burst, which comprises pilot (training) symbols and data symbols.).

Jones does not teach said filter being selected from a set of filters on the basis of an estimated carrier to interference ratio.

Cimini teaches a set of filters (Column 4 lines 62 – 66).

Jones and Cimini both teach a wireless OFDM system that uses channel estimation thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the set of filters taught in Cimini in the wireless OFDM system of Jones such that there will be a wireless OFDM system that adapts to the Doppler shift and multi-path delay spread that is in said wireless OFDM systems.

Ramesh teaches estimating a carrier to interference ratio (Column 3 lines 25 – 37).

Jones in view of Cimini and Ramesh teach a wireless communication system where the receiver uses the least squares method for channel estimation in a multi-path environment thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the carrier to interference ratio taught in Ramesh in the wireless communication system of Jones in view of Cimini for the purposes of providing improved estimates of said carrier to interference ratio for channels subject to multi-path fading effects.

Regarding Claim 18, Jones teaches a method for channel estimation in a wireless cellular orthogonal frequency division multiplex (OFDM) system, in which data symbols are transmitted in frequency sub-carriers and timeslots (Column 2 lines 36 – 40), whereby channel estimation on the basis of received pilot symbols is performed (Column 3 lines 11 – 19), whereby the channel estimation for the data symbols between pilot symbols is performed by means of a filter selected on the basis of an interference value (Figure 3, Column 3 lines 46 – 53, the IFFT/interference block is the filter that is selected due to the fact that there is interference, said filter in conjunction with the zero pad create an optimal channel estimate that minimizes the interference).

Jones does not teach said filter being selected from a set of filters on the basis of an estimated carrier to interference ratio.

Cimini teaches a set of filters (Column 4 lines 62 – 66).

Jones and Cimini both teach a wireless OFDM system that uses channel estimation thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the set of filters taught in Cimini in the wireless OFDM

system of Jones such that there will be a wireless OFDM system that adapts to the Doppler shift and multi-path delay spread that is in said wireless OFDM systems.

Ramesh teaches estimating a carrier to interference ratio (Column 3 lines 25 – 37).

Jones in view of Cimini and Ramesh teach a wireless communication system where the receiver uses the least squares method for channel estimation in a multi-path environment thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the carrier to interference ratio taught in Ramesh in the wireless communication system of Jones in view of Cimini for the purposes of providing improved estimates of said carrier to interference ratio for channels subject to multi-path fading effects.

Regarding Claims 14, 19, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claims 13, 18. Jones further teaches an interference value at the frequency sub-carrier and timeslot of the data symbol to be channel estimated is used for filter selection (Figure 3, Column 2 lines 34 – 40, Column 3 lines 46 – 53, the IFFT/interference block is the filter that is selected due to the fact that there is interference, the IFFT/interference in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for a frequency sub-carrier and timeslot of the data symbol). Ramesh further teaches an estimated carrier to interference ratio (Column 3 lines 25 – 37).

Regarding Claim 15, 20, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claims 13, 18. Jones further teaches a

wanted carrier power value at the frequency sub-carrier and the timeslot of the data symbol to be channel estimated (Figure 3, Column 2 lines 34 – 40, Column 3 lines 46 – 53, this is an OFDM system that uses channel estimation thus the IFFT/interference in conjunction with the zero pad create an optimal channel estimate that minimizes the interference for a frequency sub-carrier and timeslot of the data symbol, this means that the carrier power will increase, which is a desired characteristic).

Regarding Claims 16, 21, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claims 14, 19. Cimini further teaches a frequency filter that is selected on the basis of a difference vector between frequency sub-carriers adjacent to the frequency sub-carrier of the data symbol to be channel estimated (Column 4 lines 57 – 59, Column 4 lines 62 – 63, the delay spread coupled with the inherent windowing of the FFT processing will cause the adjacent sub-carriers to interfere with each other (inter-channel interference) which means that the frequency difference between said adjacent sub-carriers will vary with said delay spread thus there will be an inherent difference vector).

Regarding Claims 17, 22, Jones in view of Cimini and in further view of Ramesh teaches all of the claimed limitations recited in Claims 14, 19. Cimini further teaches a time filter that is selected on the basis of a Doppler frequency of the estimated channel (Column 4 lines 55 – 57, Column 4 lines 62 – 63).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

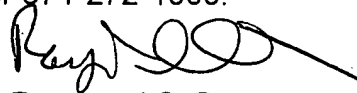
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond S. Dean whose telephone number is 571-272-7877. The examiner can normally be reached on Monday-Friday 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

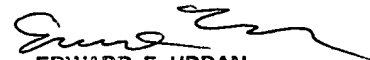
Art Unit: 2618

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Raymond S. Dean

October 31, 2006



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